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Remarks:

25X1 [redacted] requested info on TAGBOARD but rather than sending it to him, I sent it to DDS&T with a note that a copy is attached for 25X1 [redacted] if Carl desires to pass it on. 25X1 [redacted] wanted info about TAGBOARD for 25X1 [redacted] as background info for the 23 August ExCom Meeting.

JP

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FROM: NAME, ADDRESS AND PHONE NO.	DATE
	17 Aug

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NRO REVIEW COMPLETED

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[redacted]-2559-67 25X1
17 August 1967
Copy 5 of 8

MEMORANDUM FOR: Deputy Director for Science and Technology

SUBJECT: TAGBOARD Program

1. This memorandum is for information only.

2. This Office has little information about the TAGBOARD program since its transfer to Director, Program D, NRO, in 1963. However, since the Agency handles contracting for TAGBOARD, some background information is available. A significant events summary chronology of the program is attached, based largely on information available to the Office of Special Activities Contracting Officer.

3. Additional comments about the program that follow are based on informal remarks made in the past several weeks by Kelly Johnson, Col. Clason B. Saunders, Director, Program D (case officer of the program) or as indicated.

4. Initially the TAGBOARD D-21, Mach 3.3, drone was to be carried on top of and launched from specially modified A-12 aircraft (originally two) which were designated M-21s. In this configuration the D-21 drone ramjet engine was to be ignited, checked out while attached to the M-21 and launched at speeds of Mach 3 - 3.2 for cruise flights at altitudes of 85-95,000 feet for a distance of about 3,000 miles. At recovery, camera, payload and certain equipments are ejected and retrieved, by a parachute air snatch accomplished by special C-130 aircraft, with the basic D-21 drone vehicle being destroyed.

5. After loss of an M-21 aircraft during a flight test launch in 1966, the program was reviewed by NRO and reoriented. Two B-52-H aircraft were substituted in place of the M-21 launch aircraft and configured to accommodate a modified D-21 drone, redesignated the D-21B, which would be gravity dropped from the B-52H launch vehicle. The reoriented program required an addition to the D-21B drone of a solid propellant

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rocket booster (in essence a second stage) and associated equipment to enable the drone to be accelerated, after drop from the B-52H, to an appropriate altitude and ram pressure (to start the inlet) at which time the D-21B drone ramjet engine would be ignited. The program called for the use of a solid rocket, which had been previously qualified and man-rated for the Apollo program. However, according to Col. Saunders, sometime after the reoriented program was under way, Kelly Johnson ascertained that the new D-21B configuration needed more thrust and, as a result, the rocket had to be redesigned and increased in size to accommodate the new requirement. Recently problems have been encountered with qualifying the redesigned rocket. Kelly Johnson said that quality control problems were encountered in the rocket case materiel but corrective action has been undertaken. Also according to Col. Saunders, it was necessary to add a flame shield type of nozzle to the aft end of the rocket to protect the drone from hot exhaust temperatures of the rocket. Aside from the aforementioned major redesign effort, we have been hearing (off the record) of some concern being expressed by Lockheed performance people about the eventual range of the D-21B drone, originally forecast at 3000 nm. OXCART practical flight experience in Southeast Asia indicates that the severity of upper air hot day temperatures (above standard day) encountered may reduce D-21B specification range by as much as 10% in similar situations. Also, there is some concern that wind shears or rapid temperature changes may possibly induce flameouts when operating in areas of the world where these situations are encountered.

6. Step by step, the TAGBOARD reoriented program has evolved from a purported initial simple second stage configuration, with an on-the-shelf qualified rocket capability, into a redesigned one of increased size and complexity. It is not known to what extent Kelly Johnson returned to the wind tunnel to verify these rather major changes from the initial approved reoriented TAGBOARD program. Kelly Johnson, however, exudes his usual confidence forecasting the satisfactory demonstration of the D-21B in four test flights scheduled later this year. It is a rather optimistic feeling for such a complex reoriented program (new first stage, i.e., B-52H and addition of a second stage, i.e., rocket et al.)

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JOHN PARANGOSKY
Deputy Director of Special Activities

Attachment:
As noted above

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DD/SA/JParangosky [redacted] (17 Aug 67)
Distribution:
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5 - DD/SA w/att
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8 - RB/OSA w/att

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Attachment to
[redacted] 2559-67

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I. Summary TAGBOARD Chronology

A. July 1962

Lockheed Aircraft Corporation (LAC) authorized to perform a drone configuration and feasibility study for approximately six months.

B. December 1962

LAC authorized to proceed towards design and fabrication of 20 drones and conversion of two A-12 aircraft [redacted] to launch vehicles. Definitive contract later provided essentially for the following:

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1. Conversion of two A-12 aircraft to M-21 launch aircraft

2. Fabrication of 20 D-21 drones

3. Static testing of one of the 20 drones

4. Flight test of 12 airplane months, including demonstration of specifications

5. Initial spares, AGE, manuals, facility construction [redacted] 25X1

25X1 [redacted] and other related items.

C. March 1963

Hycon authorized to proceed with fabrication of cameras. Definitive contract later provided essentially for:

1. One prototype HR-335 camera

2. Nine production HR-335 cameras

3. Flight test program

4. Initial spares, AGE, manuals, etc.

D. October 1963

At NRO request technical responsibility for the program was

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transferred from CIA/OSA to General Geary (now Col. Saunders), Program D Director, with contracting to remain with CIA/OSA.

E. April 1966

LAC authorized to proceed with production of 15 additional Model D-21 drones.

F. August 1966

On fourth test drone launch over PMR the M-21 launch aircraft (S/N 135) was destroyed leaving one M-21 aircraft S/N 134 as the only launch vehicle. Of the initial 20 drones fabricated, this left 15 D-21 drones (one used for static testing and four for launches). Without a back up launch vehicle, program was re-evaluated.

G. September 1966

LAC advised to continue program on a limited basis.

H. December 1966

LAC provided with one B-52H aircraft (as a replacement for M-21 launch aircraft) for modification to a launch configured aircraft, but to continue program on a limited basis.

I. January 1967

After NRO review program reoriented: LAC authorized to:

1. Retrofit the 15 remaining D-21's to D-21B configuration

2. Fabricate seven additional D-21B's in lieu of the 15 D-21's previously authorized

3. Modify the B-52H aircraft

4. Produce long lead items for modification of second B-52H launch aircraft

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J. May 1967

LAC advised to procure long lead items for eight additional drones. (15 retrofit, 7 production and long lead for 8)

K. July 1967

LAC advised to proceed with twelve additional drones (15 retrofit and 19 production).

L. August 1967

LAC delivery schedule received for current approved program:

Drone Delivery Schedule

Retrofit D-21 Drones to D-21B Aircraft Configuration:

Serial Number	Date
501	1967 July
507	August
508	August
509	September
510	September
511	October
512	October
513	November
514	November
515	December
516	December
517	1968 January
518	January
519	February
520	February

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Production D-21B Drones:

Serial Number	Date
521	1968 March
522	April
523	May
524	June
525	July
526	August
527	September
528	October
529	November
530	December
531	December
532	1969 January
533	February
534	March
535	March
536	April
537	May
538	June
539	June

M. August 1967

Proposal received from Hycon to finish the updating of the ten cameras previously furnished under the initial contract and to deliver eleven additional cameras. (After the loss of launch aircraft S/N 135 Hycon was also advised to work on a limited basis, i.e., procurement of long lead items, etc., until approval to proceed with reoriented program was received.)

N. A second B-52H launch aircraft has been assigned to the program and furnished to LAC for modification in September 1967. Estimated completion of modification is December 1967 including check-out.

[redacted]

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II. General

A. Initial D-21B drone flight testing will be conducted from [redacted] through December 1967 [redacted] Four drone test launches are scheduled to be made by the end of December 1967 to demonstrate specifications. It is also planned that two of the launches will include Hycon camera tests.

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B. The following NRO funding has been allocated, thus far, to the TAGBOARD program as indicated:

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[redacted]

*As of 15 August 1968

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**Includes [redacted] for long lead items for procurement of sixteen drone systems to be procured in FY 1969. (Contractors, LAC and Hycon, have been advised that future procurements are anticipated to be: sixteen drones and eight cameras per year.)

[redacted]

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